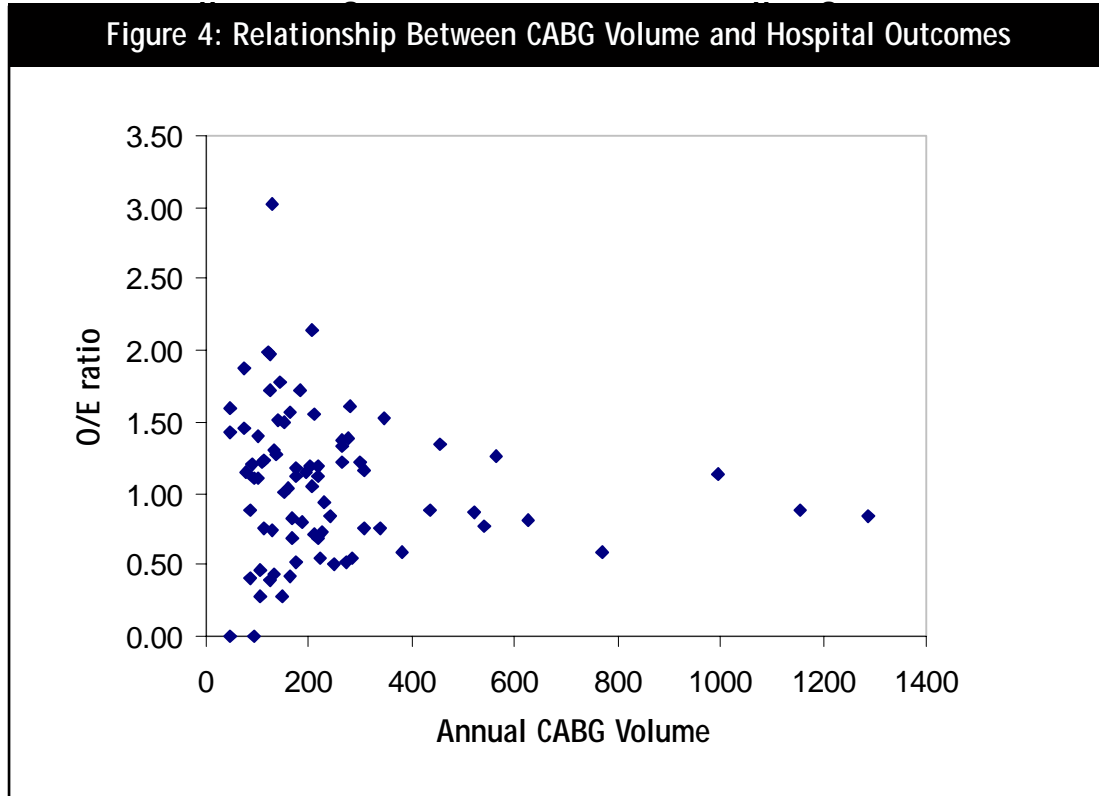


VII. HOSPITAL VOLUME AND CORONARY ARTERY BYPASS GRAFT SURGERY OUTCOMES

This report began with the observation that only 50 out of 118 California hospitals perform more than 200 CABG surgeries annually, the minimum number recommended by the American College of Cardiology. We can use the results in the preceding section to address the question of whether the volume of CABG surgeries at the hospital level is related to good or bad outcomes. Figure 4 displays a plot that shows the relationship between annual CABG volume and average hospital outcomes, as measured by the O/E ratio. Each dot in Figure 4 identifies a single hospital. For example, the dot near the upper left corner of the figure describes a hospital whose annual volume was 129 CABG cases per year for the 1997–1998 period, with an O/E ratio of slightly above 3.0. The right-most dot in the figure describes a hospital that averaged 1,286 cases per year and exhibits an O/E ratio of 0.86.



A regression line through these points is almost flat (it has a very slight negative slope, but that slope is not statistically significantly different from zero), indicating that for the hospitals that submitted their data to CCMRP, there appears to be no overall relationship between annual volume and risk-adjusted outcome. However, it is clear that lower-volume hospitals exhibit highly variable performance. Both the lowest and the highest risk-adjusted outcomes can be observed among low-volume hospitals, although in nearly all cases the low volumes make

those outcomes statistically indistinguishable from an O/E of 1.0 (i.e., given wide confidence intervals around the expected mortality rate). In contrast, there is much less variability among higher-volume hospitals. It is possible that with future data and analysis the lowest statistically valid O/E ratio will occur in a low volume hospital; however, it will take several additional years to accumulate enough cases to validly characterize O/E ratios in low volume hospitals. While the lowest O/E ratios can be found among low-volume hospitals, none of the highest volume hospitals have a poor O/E ratio.